

**Public Workshop**  
**Proposed Rule 445**  
**(Wood Burning Appliances)**

**Air Quality Background:**  
**Particulate Matter/ Health Effects**

January 31, 2007



# PM Standards Comparison

	Prior	Current
<b>PM<sub>2.5</sub></b>		
Annual	15 µg/m <sup>3</sup>	No Change
24 hr	65 µg/m <sup>3</sup>	35 µg/m <sup>3</sup>
<b>PM<sub>10</sub></b>		
Annual	50 µg/m <sup>3</sup>	Revoke
24 hr	150 µg/m <sup>3</sup>	No Change

# Background

- Last PM measure from 2003 AQMP
- Seeks to reduce current and future PM<sub>2.5</sub> emissions
- Similar rules adopted in other districts (San Joaquin Valley & Sacramento)
- Working Group formed
  - Kick-off meeting: July 2006
  - Second meeting January 2007

## Background (cont.)

- > 5 million housing units in District
- ~ 1.9 million wood burning units
- ~ 1.4 million actually used
- Average annual day emissions = 10 tpd PM<sub>2.5</sub>
- Winter day emissions = up to 30 tpd PM<sub>2.5</sub>

# Rule 445 – Key Requirements

- Limits future sales to best technology
- Prohibits installation of uncontrolled fireplaces in new developments/remodels
- Prohibits wood burning during Rule 444 “no burn” days (average 3 to 4 days per year)
- Prohibits transfer of property with non-compliant wood burning heaters after 1/2012 in areas with higher PM2.5 levels

# Schedule

- Public Workshop – January 31<sup>st</sup>
- Draft Environmental Assessment (EA)  
~ Week of February 5<sup>th</sup>
- Next Working Group meeting – February 15<sup>th</sup>
- Comments on PDSR due – February 21<sup>st</sup>
- Set Hearing – March 2<sup>nd</sup>
- Public Hearing – April 6<sup>th</sup>

# Emissions Inventory & Cost

## Proposed Rule 445 - Wood Burning Appliances

January 31, 2007

# PDSR - Emissions Inventory

- Report prepared by Dr. James Houck
  - recognized expert in residential wood combustion emissions
  - funded primarily by Hearth, Patio, and Barbeque Association (HPBA) with limited AQMD funding



# Emission Inventory

- Key variables:
  - 27% of fireplaces not used
  - cord of wood = 3,100 lbs
  - average traditional fireplace wood burning per household, 0.22 cords or 682 lbs
  - average wood heater wood burning per household, 0.95 cords or 2,945 lbs

# Emission Inventory

- 2002 Appliance Types (OMNI)

	South Coast Air Basin	
Appliance Type	Number Owned	Number Used
Conventional pre-EPA certification wood heaters	161,260	148,008
EPA-certified non-catalytic wood heaters	34,341	33,107
EPA certified catalytic wood heaters	14,134	13,632
Pellet Heaters	9,490	9,278
Fireplaces without inserts	1,673,684	1,221,721
Total	1,892,909	1,426,746

> Five million total households in District

# Emissions Inventory

- 2002 PM estimates (OMNI)

Appliance Type	PM2.5 (tons/day)	
	Basin	Coachella Valley
Conventional pre-EPA certification wood heaters	9.07	0.43
EPA certified non-catalytic wood heaters	0.65	0.03
EPA certified catalytic wood heaters	0.32	0.02
Pellet heaters	0.03	<0.01
Fireplaces without inserts (wax/fiber logs included)	9.85	0.19
Total	19.92	0.68

# Emission Inventory Adjustments

- Adjustments to wood burning rates made to provide a range of emissions estimates
  - Wood burned in wood burning heaters reduced from 3,000 to 2,000 lbs.
  - Wood burned for aesthetics and relative heating reduced from 678 to 213 lbs.

# Emissions Inventory

- Adjusted 2002 PM estimates

Appliance Type	PM2.5 (tons/day)	
	Basin	Coachella Valley
Conventional pre-EPA certification wood heaters	6.26	0.30
EPA certified non-catalytic wood heaters	0.45	0.02
EPA certified catalytic wood heaters	0.22	0.01
Pellet heaters	0.03	<0.01
Fireplaces without inserts (wax/fiber logs included)	3.13	0.08
Total	10.1	0.41

AQMP Basin 2002 PM2.5 anthropogenic emissions inventory – 101 tons per day

# Emissions Reductions

- Assumptions (new construction)
  - 54,000 housing units constructed per year\*
  - 40% are construed w/fireplaces (ARB, 1997)
  - 75% would be dedicated natural gas (staff estimate)
  - Remaining 25% constructed w/traditional uncontrolled fireplaces
    - ~5,000
  - Uncontrolled fireplaces replaced with EPA Phase II certified (10%), natural gas (85%), electric (5%)

\* US Census, average 2000-05 for four county area

# Emissions Reductions

- Assumptions (commercial facilities)
  - 250 existing commercial facilities with traditional fireplaces (staff estimate)
  - 125 replaced with EPA Phase II certified
  - 125 replaced with natural gas units
- Assumptions (property transfers)
  - 2,741 annual properties subject to change-out (10% of total Riverside/San Bernardino Counties)
  - replaced with EPA Phase II certified (70%), natural gas (20%), removed/rendered inoperative (10%)

# Cost Data

- Assumptions
  - \$2,500 EPA Phase II certified\*
  - \$500 dedicated natural gas\*
  - \$400 electric\*
  - \$3,600 EPA Phase II certified\*\*
  - \$3,200 dedicated natural gas\*\*
  - \$500 remove/render inoperative\*\*\*

Notes:

\* - Sacramento Metropolitan AQMD, 2006

\*\* - OMNI Environmental, 2006

\*\*\* - Staff estimate



# Cost Effectiveness

- Requirements for new construction and burn prohibitions  
~\$2,800 per ton PM2.5 reduced
- Requirements for commercial facilities and burn prohibitions  
~\$14,000 to 27,000 per ton PM2.5 reduced
- Requirements for property transfers  
~\$14,000 per ton PM2.5 reduced

# Draft Rule Provisions

## Proposed Rule 445 - Wood Burning Appliances

January 31, 2007

# Background

- Last PM measure from 2003 AQMP
- Applicable to residential and commercial wood burning units
  - Traditional fireplaces
  - Wood stoves and inserts
  - Masonry heaters
- Seeks to reduce current and future PM<sub>2.5</sub> emissions
- Similar rules adopted in other districts (San Joaquin Valley & Sacramento)

## Background (cont.)

- Working Group formed
  - Kick-off meeting: July 2006
- Fall 2006 - Cosponsored contract with HPBA to develop emissions inventory
- Held Working Group Meeting January 18, 2007

# Wood Burning Appliances

- Traditional fireplace  
(AKA fireplace w/o insert)
  - vast majority of existing units
  - includes dedicated natural gas units (e.g., ceramic logs)



# Wood Burning Appliances

- Fireplace inserts  
(AKA wood burning heater)  
Typically has blower for air circulation
  - includes EPA-certified (1990+ ) and non-certified (pre-1990)
  - can burn wood, pellets, corn, etc.



# Wood Burning Appliances

- Wood burning stove  
(AKA wood burning heater)
  - includes EPA-certified (1990+ ) and non-certified (pre-1990)
  - includes cat. and non-cat.
  - can burn wood, pellets, corn, etc.



# Heating Gas Fireplaces

Dedicated Natural Gas



- Natural Gas Insert



- Free Standing Stove



## Rule 445 Summary

- (a) & (b) Purpose and Applicability
- (c) Definitions
  - based on other air district's regulations, federal regulations, ASTM and other standards

## (d) Requirements

(1) No person shall sell ... install ... a new wood burning appliance unless it meets one of the following:

- EPA Phase II-Certified wood burning heater;
- Pellet-fueled wood burning heater;
- Masonry heater; or
- Wood burning fireplace determined to meet US EPA Phase II-Certification standards

## **(d) Requirements (continued)**

- (2) No person shall sell ... a housing unit with more than one wood burning appliance that meets one of the criteria in (d)(1) in new developments and remodels constructed after 1/1/08

## **(d) Requirements (continued)**

- (3) No person shall sell ... install ... a used wood burning appliance unless it meets one of the criteria in (d)(1)
- (4) No person shall install and operate any wood burning appliance unless in accordance with the manufacturers specifications
- (5) No person shall sell ... supply ... wood advertised as seasoned unless the wood has a moisture content of 20% or less

## **(d) Requirements (continued)**

(6) No person shall cause or allow any of the following materials to be burned:

\* garbage, treated wood, plastic, etc.

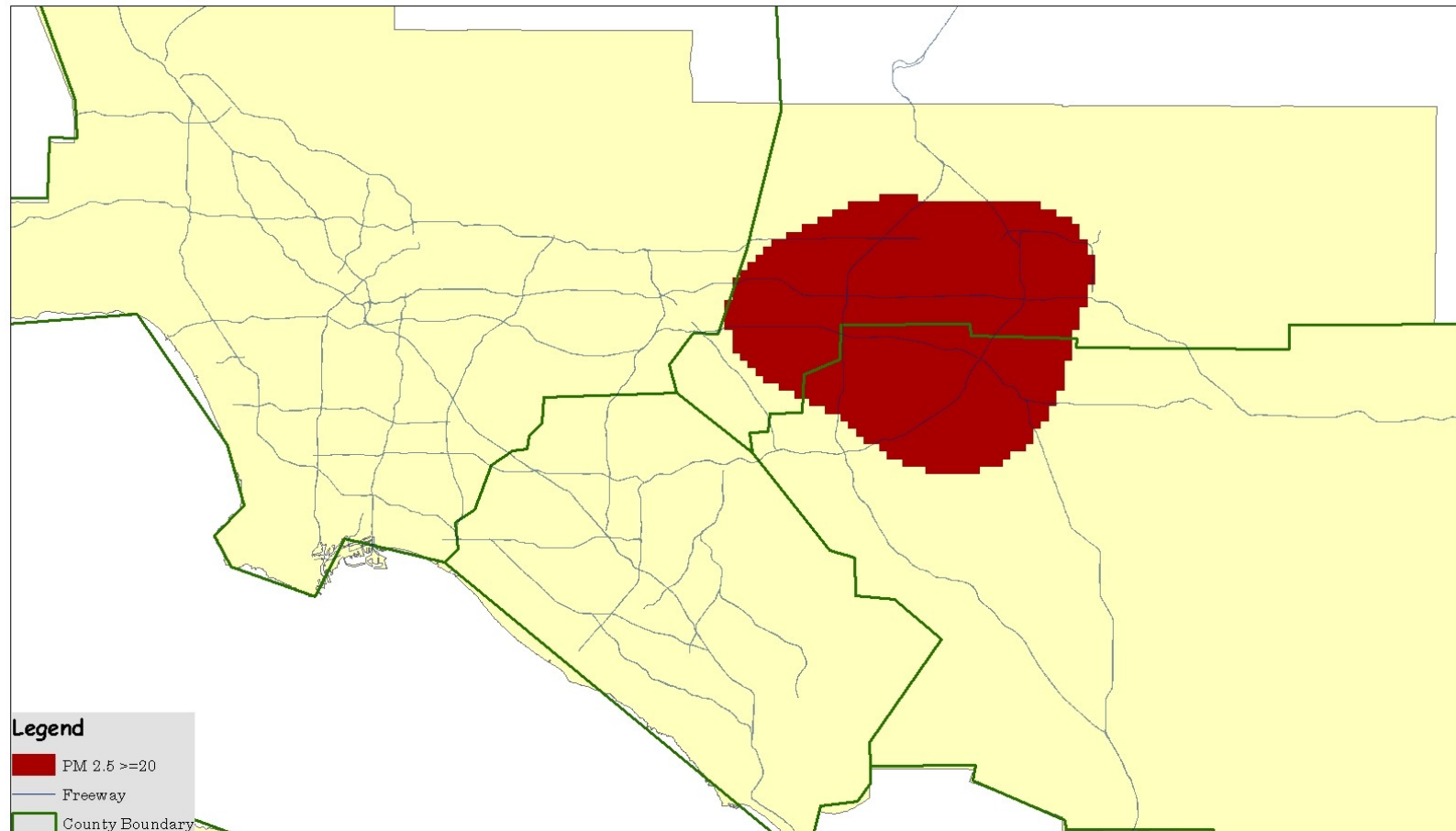
(7) Beginning 1/1/2010, no commercial operation shall operate a wood burning appliance unless it meets one of the following:

- EPA Phase II-Certified wood burning heater;
- Pellet-fueled wood burning heater;
- Masonry heater; or
- Wood burning fireplace determined to meet US EPA Phase II-Certification standards

## **(d) Requirements (concluded)**

- (8) Wood burning prohibited when a “no burn” day is forecast under District Rule 444
- (9) Beginning 1/1/2012, no person shall sell or transfer real property with a wood burning heater in areas with PM<sub>2.5</sub> levels  $>20 \mu\text{g}/\text{m}^3$  without assuring that each is:
  - EPA Phase II-Certified;
  - Pellet-fueled; or
  - Rendered inoperable

# PM 2.5 Concentrations $>20 \mu\text{g}/\text{m}^3$



## **(e) Public Awareness Information**

- (1) Wood burning appliance retailers must provide the following public awareness information at the point of sale:
  - Operation and maintenance parameters; and
  - Proper fuel selection and use.
- (2) Wood burning appliance retailers must provide the following District-provided public awareness information at the point of sale:
  - Health effects of wood smoke; and
  - Access to District Rule 444 burn forecasts.



## **(e) Public Awareness Information (concluded)**

- (3) Commercial firewood facilities must distribute District-provided health effects from wood smoke and District Rule 444 burn forecast information at the point of sale

## **(f) Exemptions**

(1) The rule shall not apply to:

(A) any gaseous-fueled residential appliance

(B) cookstoves

(2) The paragraph (d)(8) “no burn” provisions shall not apply to wood heaters above 3,000 MSL

# Areas Seeking Comment

- Rule elements
- Tax incentives for clean appliances
- Wood stove change-out program
- Exemption provisions
- Increased emissions during start-up for units with catalysts

## Next Steps

- Public Workshop – 1/31/07
- PDSR close of comment – 2/21/07
- Draft Environmental Assessment (EA)  
~ Week of February 5, 2007
- Set Hearing – 3/2/07
- Adopt Hearing – 4/6/07

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